The University of Texas at Tyler
Department of Electrical Engineering

Course: EENG 4312--Communications Theory (Required)

Syllabus

Catalog Description:
Signals Systems and analog modulation techniques, effects of noise in modulation, signal to noise ratio, digital data transmission, probability of error

Prerequisites: EENG 4311, EENG 3305

Credits: (3 hours lecture, 0 hours laboratory per week)

Text(s): Introduction to Communication Systems, F. Stremler
Third Edition, Addison Wesley
ISBN 0-201-18498-2

Additional Material: None

Course Coordinator: Hector A. Ochoa

Topics Covered: Amplitude Modulation; Frequency modulation; Information Theory; Digital Communications

Evaluation Methods: Examinations / Quizzes, Homework, Report, Computer Programming, Project, Presentation, Course Participation, Peer Review

Course Objectives: By the end of this course students will be able to:

1. Evaluate the system properties of basic elements and operations used in communication systems [1,2]
2. Solve problems using information theory [1,2,5]
3. Solve problems related to AM communications systems[1,2,5]
4. Be able to explain motivation for phase-lock loops and the Super-heterodyne Receiver architecture and solve problems related to these topics.[1,2]
5. Solve problems from area of angle modulation communication systems including specifically FM systems, Carson Rule and phase modulation systems [1,2,5]
6. Predict and explain communications signal spectra using DFT/FFT techniques[1,2,5]
7. Demonstrate an ability to link important concepts with terminology used in the field of communications[1,2]
8. Solve problems in digital communications [1,2]
9. Research and discuss the new advancements in the field of wireless communications by reading peer reviewed articles and making a presentation [3,6]

Numbers in brackets refer to method(s) used to evaluate the course objective.
Relationship to Program Outcomes (only items in dark print apply)*: This course supports the following Electrical Engineering Program Outcomes, which state that our students will:

1. have the ability to apply knowledge of the fundamentals of mathematics, science, and engineering;
2. have the ability to use modern engineering tools and techniques in the practice of electrical engineering;
3. have the ability to analyze electrical circuits, devices, and systems;
4. have the ability to design electrical circuits, devices, and systems to meet application requirements;
5. have the ability to design and conduct experiments, and analyze and interpret experimental results;
6. have the ability to identify, formulate, and solve problems in the practice of electrical engineering using appropriate theoretical and experimental methods;
7. have effective written, visual, and oral communication skills;
8. possess an educational background to understand the global context in which engineering is practiced, including:
   a. knowledge of contemporary issues related to science and engineering;
   b. the impact of engineering on society;
   c. the role of ethics in the practice of engineering;
9. have the ability to contribute effectively as members of multi-disciplinary engineering teams;
10. have a recognition of the need for and ability to pursue continued learning throughout their professional careers.

*Numbers in brackets refer to course objective(s) that address the Program Outcome.

Contribution to Meeting Professional Component: (in semester hours)

<table>
<thead>
<tr>
<th>Mathematics and Basic Sciences:</th>
<th>hours</th>
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<tbody>
<tr>
<td>Engineering Sciences and Design:</td>
<td>3 hours</td>
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<tr>
<td>General Education Component:</td>
<td>hours</td>
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</tbody>
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Prepared By: Ron Pieper  
Modified By: Hector A. Ochoa  
Date: Oct 10 2008  
Date: Aug 25 2009  
Date: Aug 22 2011